

# Understanding the Current Guidelines for Preparing Pediatric and Newborn Feedings in Health Facilities



ANNENBERG CENTER FOR HEALTH SCIENCES  
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*Imparting knowledge. Improving patient care.*

*Presented by*

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# Faculty Disclosures

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*Speakers Bureau*    Abbott Nutrition, Mead Johnson Nutrition

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*clinical areas for above: safe breast milk handling,  
breastfeeding the late preterm infant, current research  
in lactation, breastfeeding promotion*

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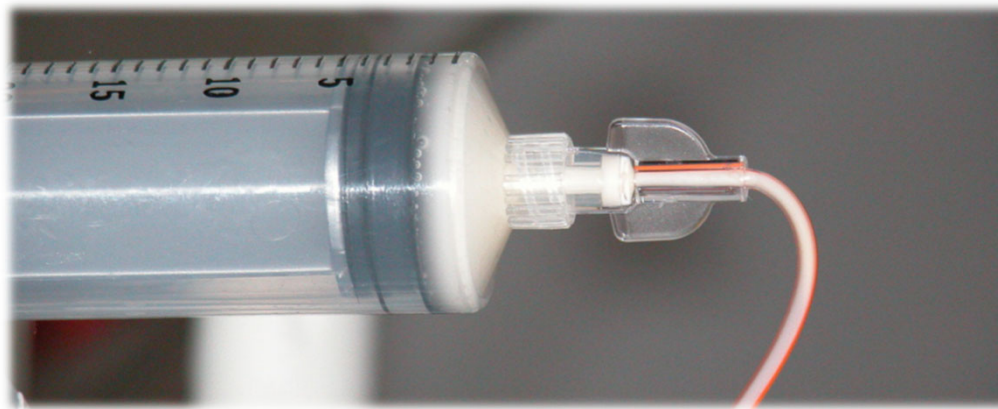
# Learning Objectives

- Recognize the risks associated with mishandling and misadministration of human milk and formula
- Review current guidelines for the safe preparation of human milk and formula feeding
- Identify at least 1 best practice for implementation within your unit or hospital



# Is the Handling of Infant Feedings a Concern?

*“In an era of sophisticated technology in medicine, safe feeding of infants may be presumed to be a relatively mundane function of a modern hospital. In fact, when subjected to close scrutiny, this is an area that has often been fraught with practices more typical of a home kitchen than a facility providing state-of-the-art medical nutrition therapy.”*



# Primary Concerns

Contamination



Preparation  
Accuracy



Misadministration

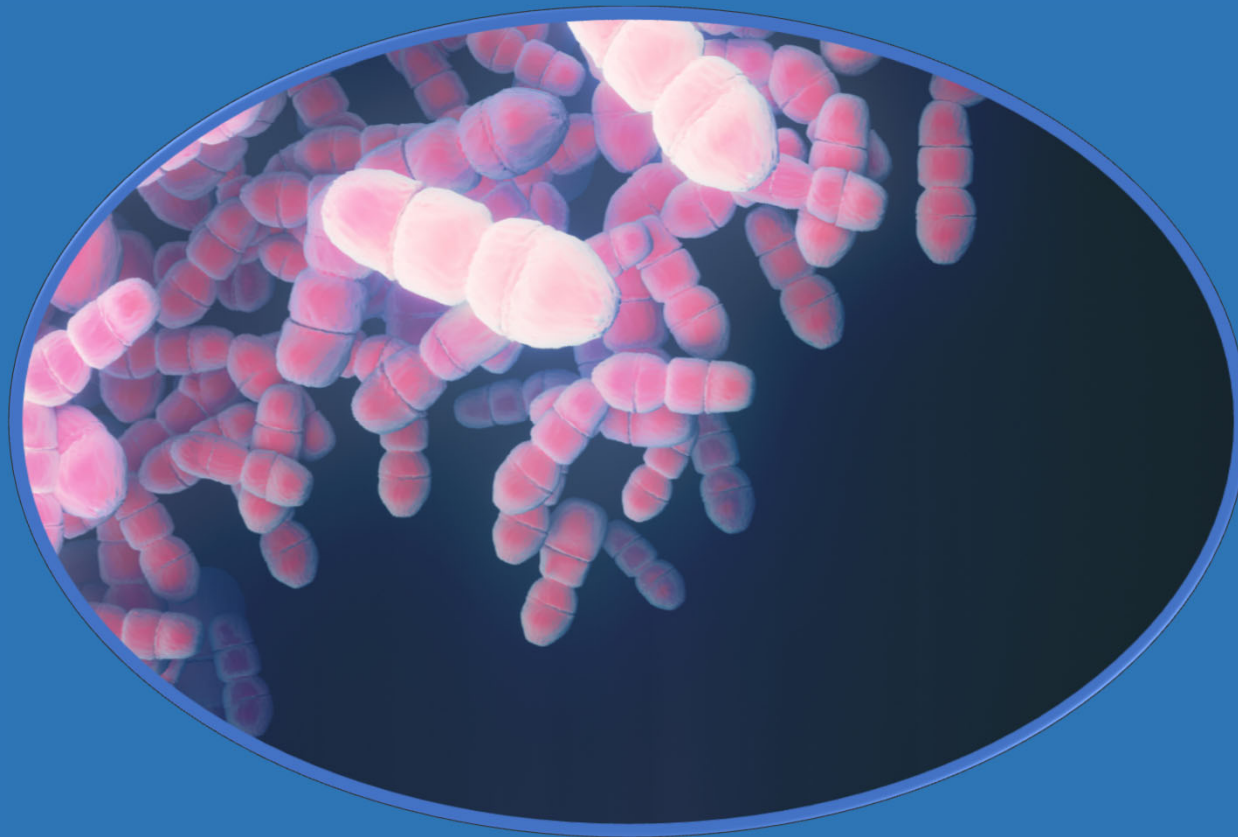


# Barriers to Practice Change

- Viewed as “just food”
- Sterile alternatives not always available
- Need for specialized regimens
- Cost
- Limited acknowledgement of problems
  - Feeding the wrong milk or formula
  - Errors in feeding orders/human milk preparation
  - Contamination of equipment/supplies
  - Poor handling bedside (hang times, changing of bags/tubing, etc)

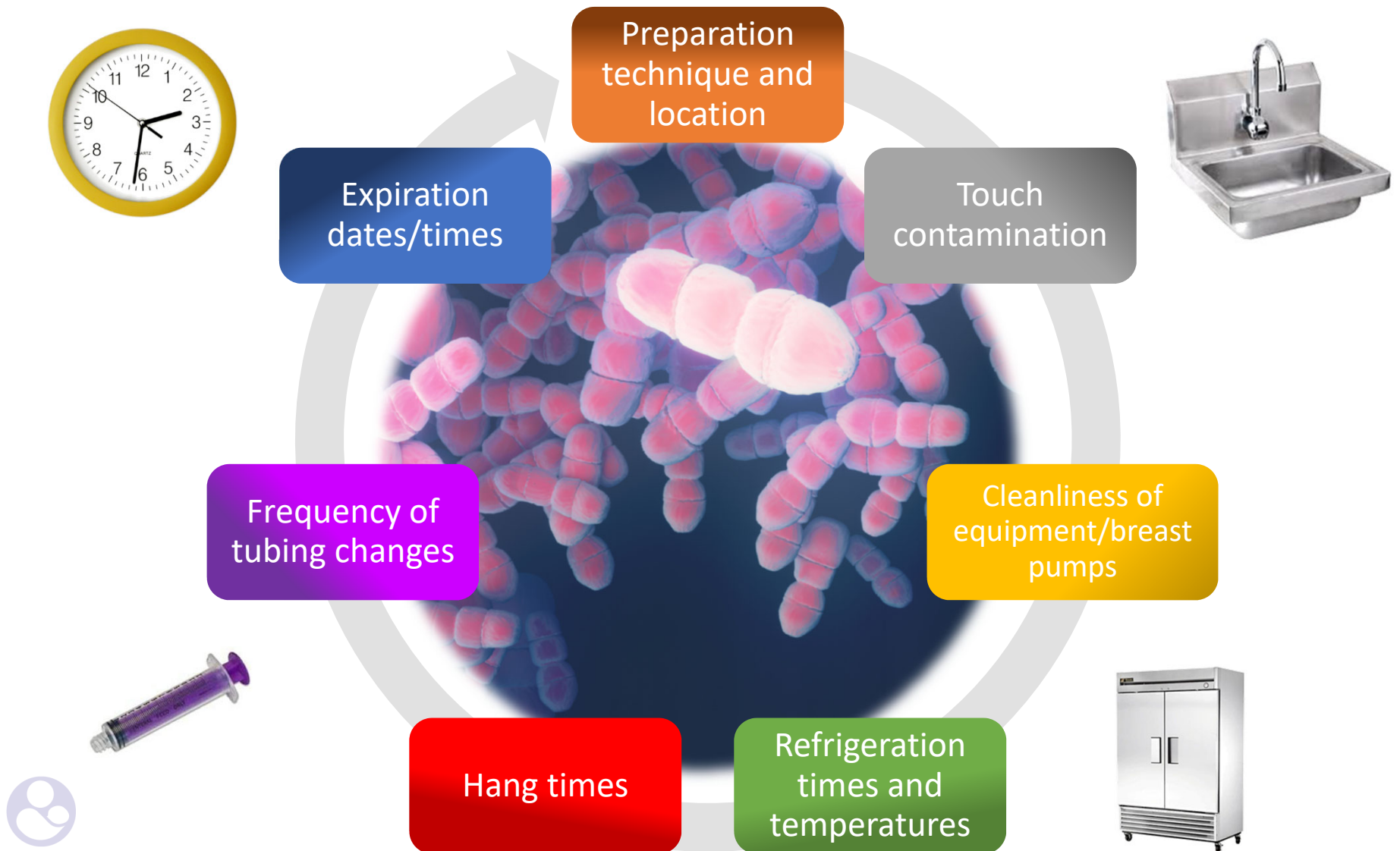


# Contamination



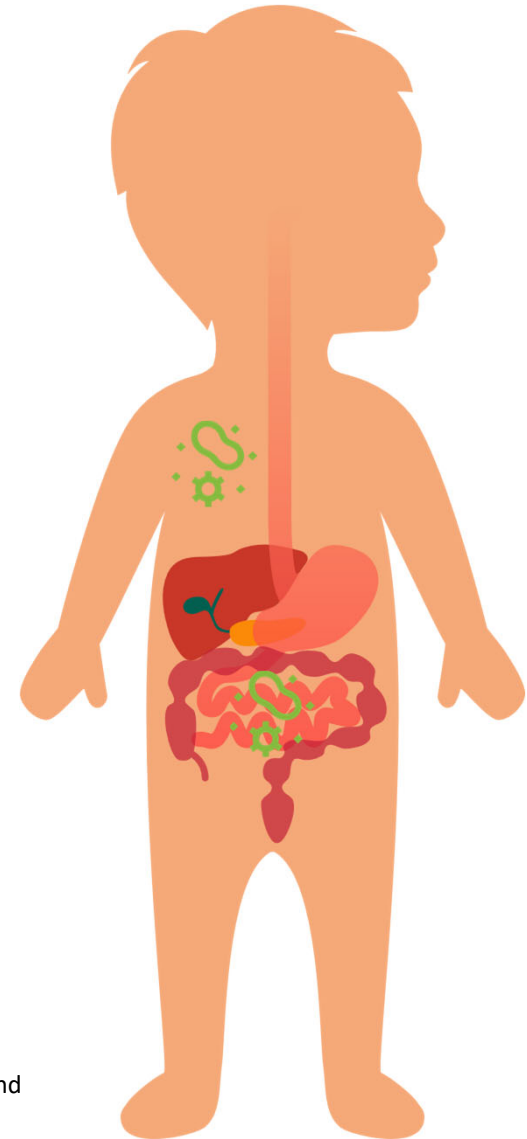


# Factors Influencing Microbial Growth



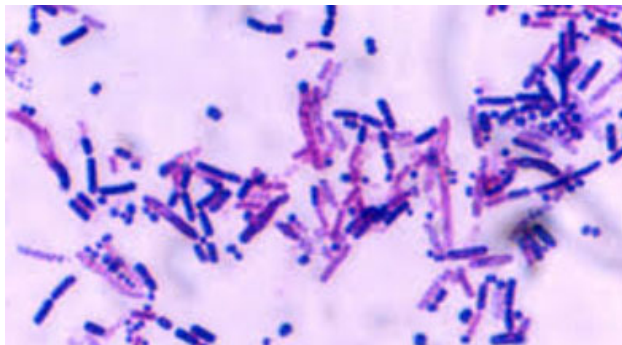
# Consequences of Contamination

- GI Illness
  - $>10^5$  CFU/mL associated with GI issues
  - Ingestion of live organisms or preformed toxin produced by organisms multiplying
  - Gastroenteritis or NEC
- Systemic Disease
  - Organisms invade beyond mucosal barrier
  - Sepsis



# Contamination of Infant Feedings Study

- Contamination of bedside vs centralized prep
- 2 phases (526 samples)
- Bedside prep 24x more likely to show contamination ( $P < 0.001$ )



## Presence of Any Microbial Growth

	Powdered Formulas	Sterile Liquid Formulas
Bedside Prep	43.7%	6.3%
Centralized Prep	4%	0%

Steele C, Short R. *J Am Diet Assoc.* 2008;108:1700-1703.



# Accuracy of Preparation



# Ensuring Accuracy With Fortification and Formulas

***So many things I have to monitor...***

**Accuracy of recipe**

**Accuracy of order  
(cross check for provider error)**

**Correct quantities  
(HM, fortifiers,  
modulars)  
are used**

**Correct fortifier/  
formula used**



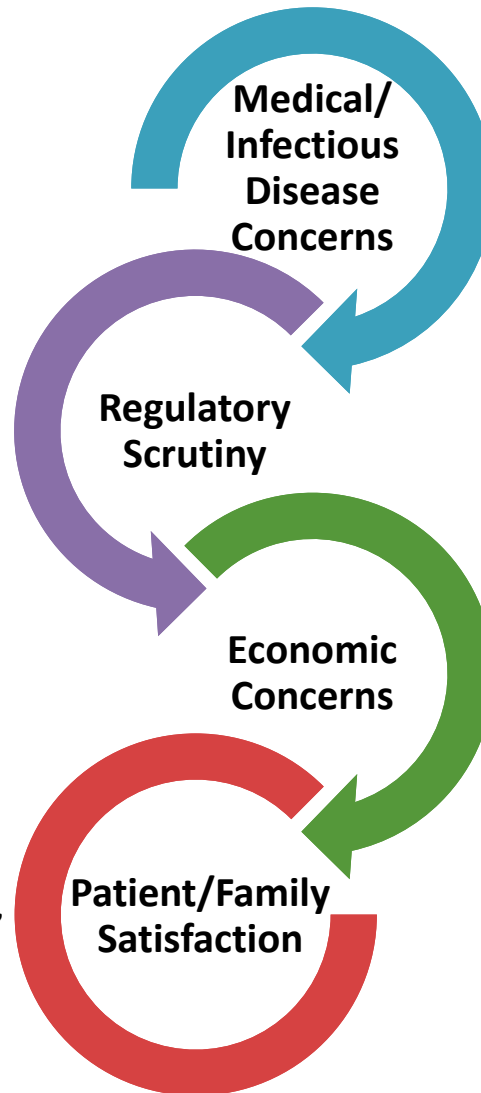
# Human Milk and Formula Misadministration



# Misadministration Consequences

- Bodily fluid exposures may be reportable events
- May be viewed as HIPAA breach

- Loss of confidence in medical care
- “What other errors are they making?”



## HM

- Hepatitis C, HIV
- Exposure to drugs/meds

## Formulas and Fortifiers

- Allergic reactions
- GI intolerance
- Metabolic complications

- HIPAA fines of \$25,000+ possible
- Blood work-up costs >\$500
- Cost of medical complications

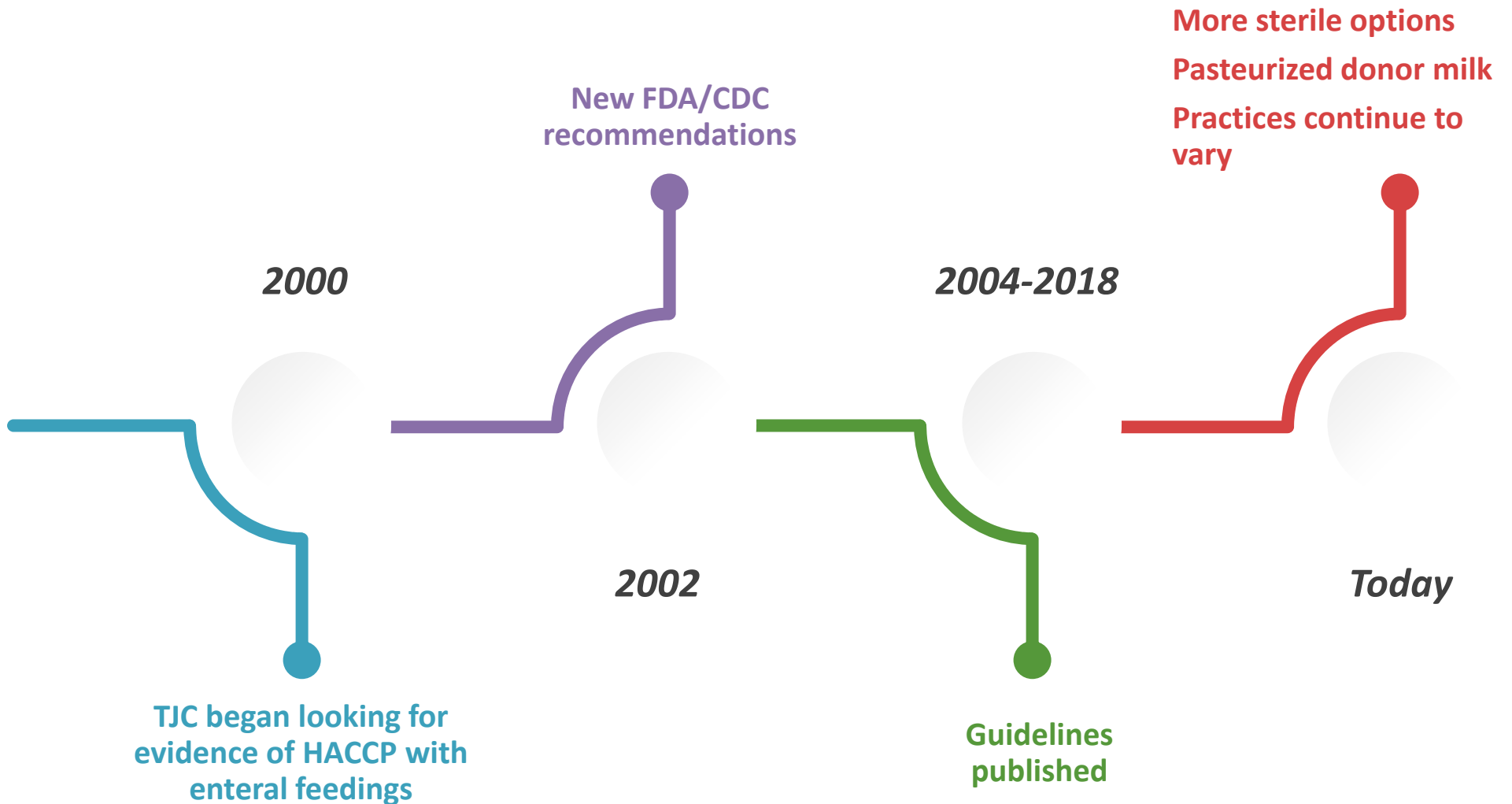


# Regulations and Guidelines





# Historical Perspective



# The Joint Commission (TJC)

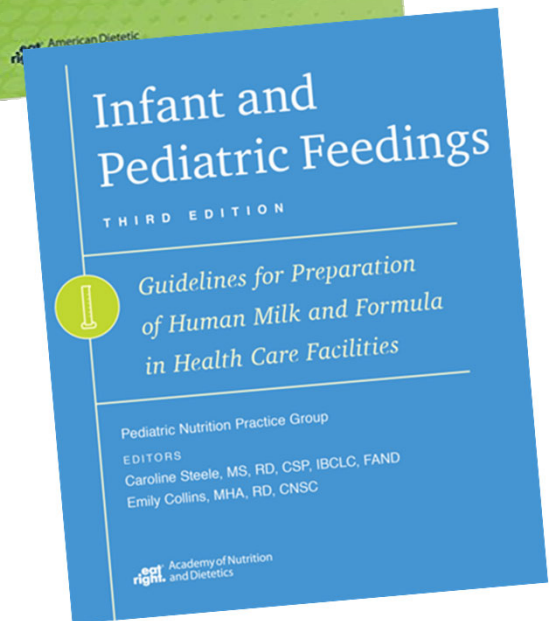
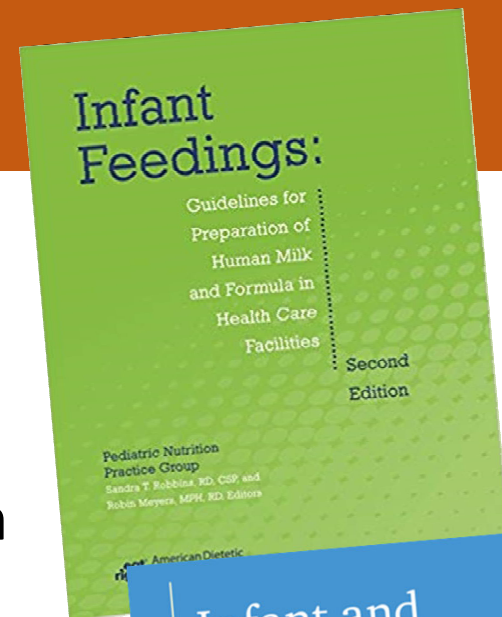


- **PC.02.02.03**
  - .01 The hospital assigns responsibility for the safe and accurate provision of food and nutrition products.
  - .06 The hospital prepares food and nutrition products using proper sanitation, temperature, light, moisture, ventilation, and security.
- **IC.01.05.01**
  - All hospital components and functions are integrated into infection prevention and control activities.
- **NPSG.01.01.01**
  - Use at least 2 patient identifiers when providing treatments or procedures.
- Hospitals throughout the country (including CHOC) have reported breast milk storage temperatures as a primary focus of TJC.



# Best Practices

- American Dietetic Association Guidelines (now Academy of Nutrition & Dietetics)
- Human Milk Banking Association of North America (HMBANA)
- American Society for Enteral & Parenteral Nutrition (ASPEN)
- National Association of Neonatal Nurses (NANN)



Robbins ST, Meyers R, eds. *Infant Feedings: Guidelines for Preparation of Human Milk and Formula in Health Care Facilities*. Chicago, IL. American Dietetic Association, 2011. Steele C, Collins E, eds. *Infant & Pediatric Feedings: Guidelines for Preparation of Human Milk and Formula in Health Care Facilities*. Chicago, IL. Academy of Nutrition & Dietetics, 2019. Boullata JI, et al. *J Parenter Enteral Nutr.* 2017;41:15-103. NANN Position Statement #3065. April 2015. Available at [http://nann.org/uploads/About/PositionPDFS/1.4.3\\_Use%20of%20Human%20Milk%20and%20Breastfeeding%20in%20the%20NICU.pdf](http://nann.org/uploads/About/PositionPDFS/1.4.3_Use%20of%20Human%20Milk%20and%20Breastfeeding%20in%20the%20NICU.pdf).



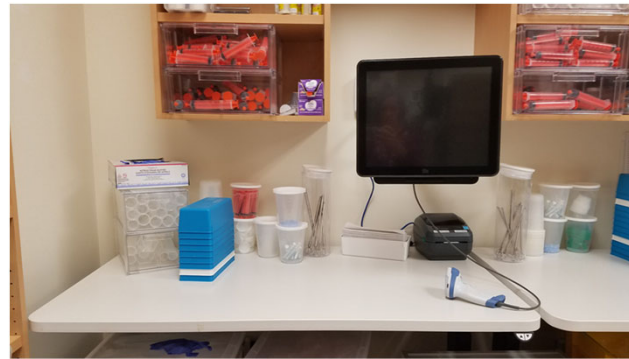
# Best Practices



Bar Code Scanning

Proper Labeling

6103724 NICU 205-01 Sample, Inpatient
Breastmilk, 24 Cal/oz. Fortified with HMF. NGT, 18 mL q 3 hours. Start 11/26/14 10:43:00
Expiration Date/Time: _____ FOR ENTERAL USE ONLY



Location

- Physically separated from direct care areas
- Used solely for purpose of HM/formula prep
- Supports aseptic technique

Unit Dosing



Quality Assurance

Infection Control



Temperature Control



Specially Trained Staff

# International Consensus Statement



- 11 authors representing the US, UK, Italy, France, Turkey, Netherlands, and Sweden
- Presented 16 May 2015
- Published in Sept 2015 supplement to *Journal of Pediatric Gastroenterology and Nutrition*
- Purpose: Come to agreement on best practices with regard to human milk and donor milk for preterm infants worldwide

## XII. Human Milk in Feeding Premature Infants: Consensus Statement

*Guido E. Moro, Sertac Arslanoglu, Enrico Bertino, Luigi Corvaglia, Rosario Montiroso, Jean-Charles Picaud, Staffan Polberger, Richard J. Schanler, Caroline Steel, Johannes van Goudoever, and Ekhard E. Ziegler*

### **CENTRALIZED HUMAN MILK HANDLING**

The utilization of quality improvement measures with regards to safe handling of HM in NICUs is becoming a common practice in many centers (26).

The following recommendations are suggested to reduce the risk of HM errors and infant feeding contamination within the hospital setting:

- Centralized preparation of HM should be performed in a dedicated space designed to support aseptic techniques in every NICU.
- Presence of a dedicated and trained staff for the preparation of HM in this specific space is desirable.
- Technology (i.e. bar code scanning) to reduce risk of preparation and administration errors and for traceability of HM is highly suggested.



# Facilities Guidelines Institute Recommendations

- 2010 FGI Guidelines for the Design and Construction of Hospitals and Outpatient facilities included the recommendation for a separate neonatal intensive care unit (NICU) feeding preparation room.
- 2014 FGI guidelines, recommendations were updated to ensure the preparation area provided a “flow of materials from clean to soiled to maintain aseptic preparation space”



# State Health Department and Building Codes

- Many states have similar requirements as part of their hospital construction regulations or licensing requirements.
- Recommendations include:
  - Area or room used exclusively for the preparation of feedings
  - Area separate from patient care (may be adjacent to NICU or elsewhere in hospital)
  - Most indicate that a refrigerator, work counter, storage facilities, hand-washing station, and separate cleanup area for washing and sanitizing are required



# Federal and State Examples



- CA:
  - Separate prep area away from patient care areas
  - Must include refrigerator, work counter, storage facilities, hand-washing station, and separate clean up area for washing and sanitizing
- DoD NICU Space Planning Criteria
  - Infant feeding prep room with breast milk and formula storage
- MA: NICU Compliance Checklist Architectural Req.
  - Space for prep/storage of formula and HM additives away from bedside with layout to provide for flow of clean to soiled
- OK, OR, GA, TX:
  - Where infant formula is prepared on-site, direct access from the formula prep room to any nursery room is prohibited.
  - Room may be located near nursery or other appropriate location.
  - Must include facilities for washing and sterilizing supplies.





# Other State Examples



- MI (R 325.1056):
  - Separate formula prep room reserved for this purpose only
  - Hand washing sink and double compartment sink
- NJ (Article 115 Formula Preparation Facilities):
  - Produced under sanitary conditions using aseptic technique
  - Separate room with no other activities occurring in the room
- MN (MS s 144.55; 144.56):
  - Formula room shall be provided in the nursery or nutrition dept where adequate supervision can be provided
  - Must be used exclusively for prep of formulas
  - 2 compartment sink for cleaning; hand washing sink; sterilization equipment



# Location, Location, Location

- Separate room distinct from patient care areas
  - Support aseptic technique
  - Conform to all other standards for handling patient food/nutrition
- In no other unit would the employee responsible for diapering, IV placement, etc be responsible for preparing meals



# US News & World Report Questions

- Does your hospital offer a dedicated area within the facility but away from the bedside for milk and formula preparation? To answer “Yes” this area must meet both of the following criteria:
  - Infant feeding prep room using the aseptic technique
  - The room requires restricted access and healthy personnel with no other activity occurring in the room
- Does your NICU program offer a specific risk reduction program that includes processes designed to reduce breast milk errors?



## US News NICU Questions *(continued)*

- If yes to above, which of the following elements does your NICU's specific risk reduction program include?
  - Individual breast milk warmers at each bedside
  - Bar code system for correct breast milk identification
  - Dedicated breast milk technician who prepares milk for proper identification and distribution
- Does your NICU program track the breast milk administration error rate?
  - If yes, please report the number of breast milk administration errors, breastfeeding patient and the breast milk administration error rate (percentage) for the last calendar year.



# Endorsements for Human Milk Bar Code Scanning



**Agency for  
Healthcare Research  
& Quality (AHRQ)**



**Institute for Safe  
Medication Practices  
(ISMP)**



**Healthcare Information  
Management Systems  
Society (HIMSS)**



**National Patient  
Safety Foundation  
(NPSF)**



# Implementing Best Practices: Our Journey at CHOC



# Failure Mode Effects and Analysis (FMEA)

- Complete review of every step of a process
- Identify all potential failure points
- Score for severity, occurrence, and detectability to obtain a Risk Priority Number (RPN)



# Risk Priority Number (RPN) Scoring

	Severity	Likely Occurrence	Detection
1	No effect	Almost never	Almost certain
2			
3			
4			
5			
6			
7			
8			
9			
10	Hazardous	Failure almost certain	Almost impossible

RPN = Severity Score x Occurrence Score x Detection Score





# Human Milk FMEA Results

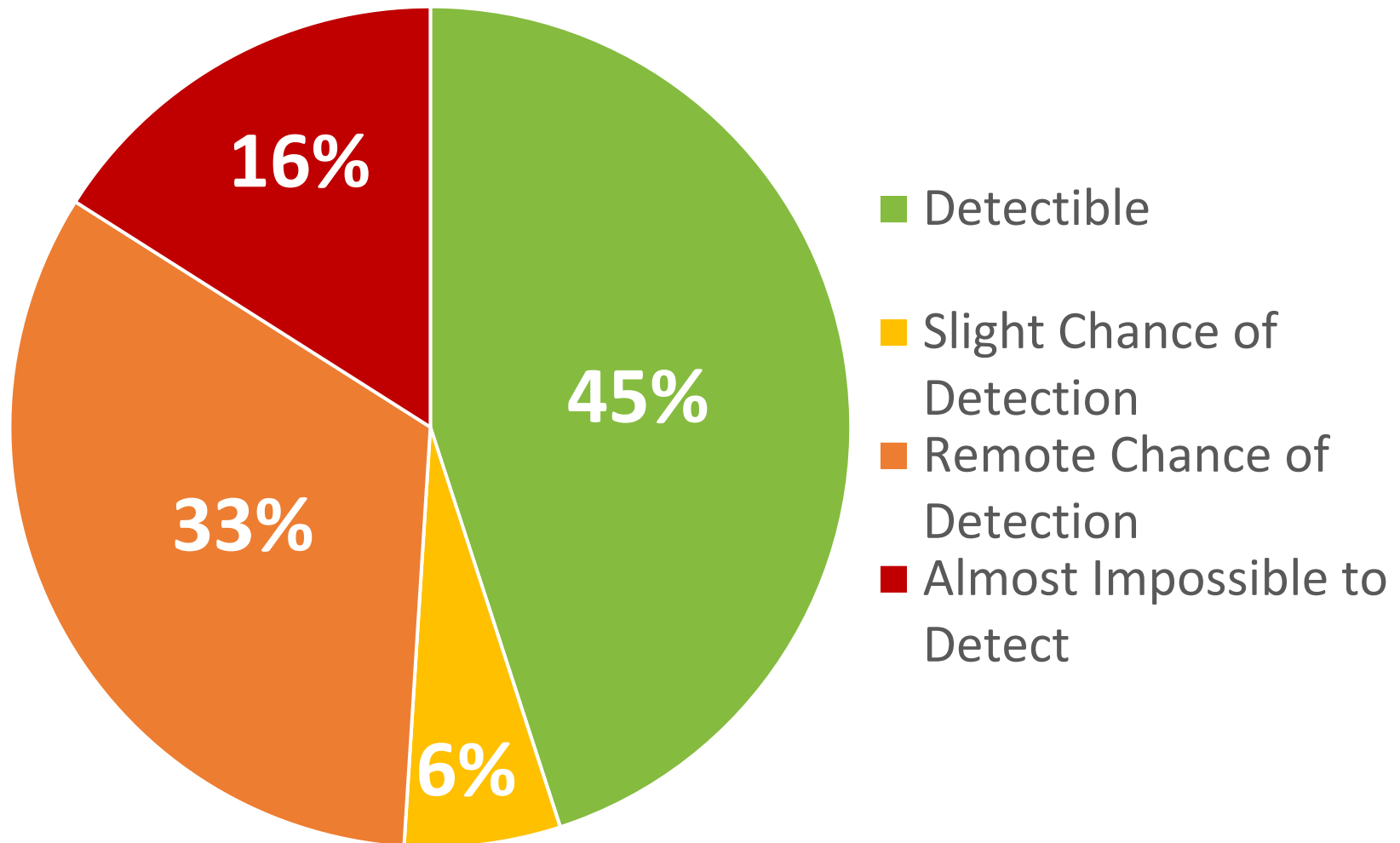
- Conducted as a result of 3 errors in short time period
- 282 potential failure points
- RPN ranged from 1-810
- Root causes were identified for each of the 85 failure points with an RPN score of 160 or higher

The image shows a portion of an FMEA matrix grid. The grid is tilted and has three main columns: Severity, Likely Occurrence, and Detection. The rows are numbered 1 through 7. The Severity column has labels: 1 (No effect), 2, 3, 4, 5, 6, 7. The Likely Occurrence column has labels: Almost never, and failure almost certain. The Detection column has labels: Almost certain, and Almost impossible. Three green arrows point from the text in the list to specific cells in the grid: one points to the cell at Severity 3, Likely Occurrence Almost never, and Detection Almost certain; another points to the cell at Severity 5, Likely Occurrence failure almost certain, and Detection Almost certain; and a third points to the cell at Severity 7, Likely Occurrence failure almost certain, and Detection Almost impossible.

	Severity	Likely Occurrence	Detection
1	No effect		
2			
3		Almost never	Almost certain
4			
5		failure almost certain	Almost certain
6			
7			Almost impossible



# Detectability of Top 85 Potential Failure Points



# Sample Root Causes

## 2011 Failure Mode and Effects Analysis Breast Milk Collection, Storage, Administration, and Discharge Processes

Process	Failure Mode	RPN Score (Severity/Occurrence/ Detectability)	Root Causes
Administration	Breastmilk double check not performed at bedside immediately prior to administration	810 (9/9/10)	Staff availability, ambiguity regarding the double check process, accessibility of armband due to positioning, swaddling, and isolation or not perceived to be necessary due to familiarity with patient; habit
Administration	Breastmilk double check incomplete	810 (9/9/10)	Staff availability, ambiguity regarding the double check process, accessibility of armband due to positioning, swaddling, and isolation or not perceived to be necessary due to familiarity with patient; habit
Administration	Inconsistency in what is being checked on the armband	810 (9/9/10)	Unclear understanding of the policy, only checks whatever is convenient to view on armband

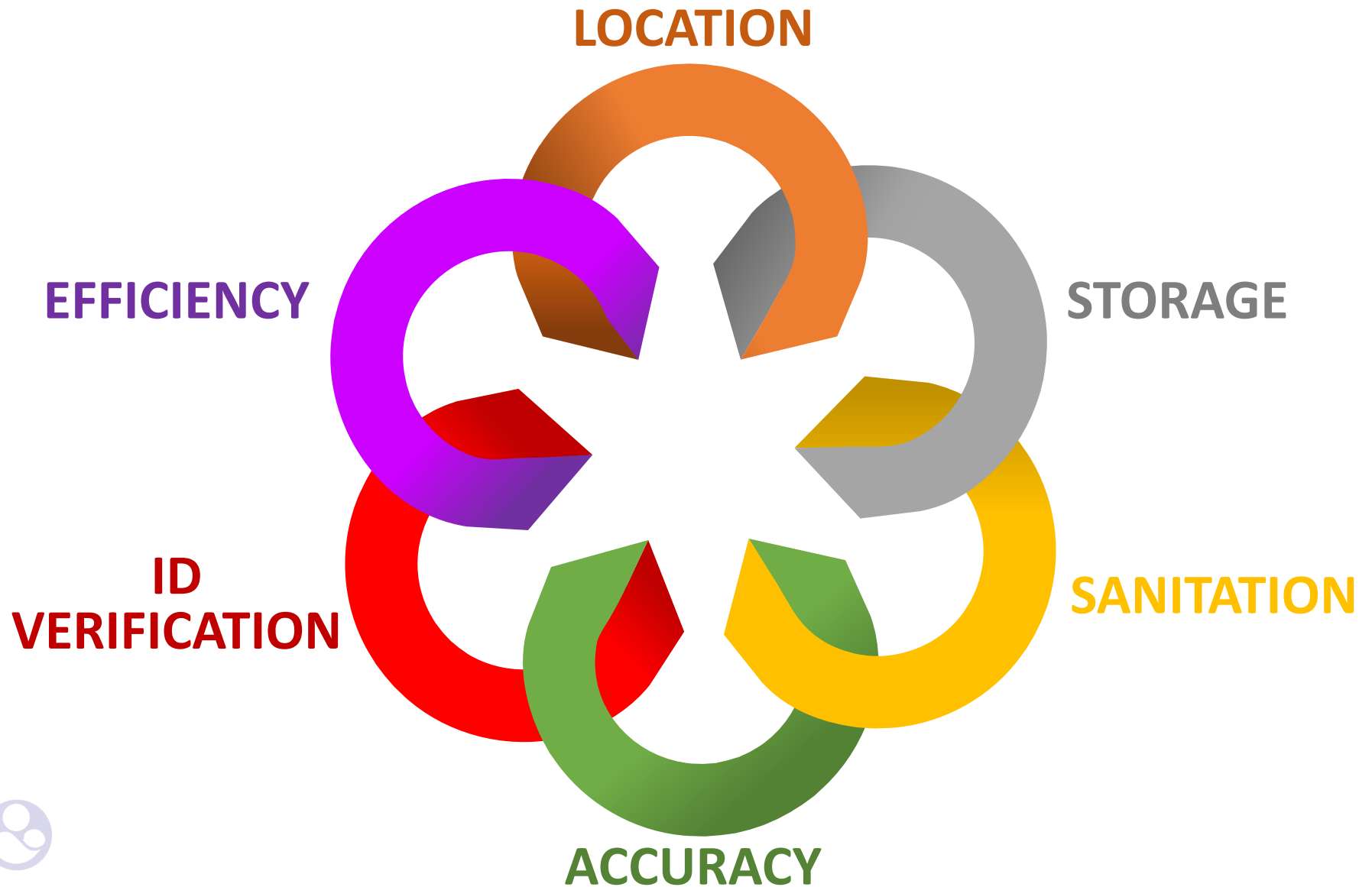


# Evaluation of Potential Failure Points

- NICU alone administers over 10,000 feedings per month
  - RN may handle breastmilk 12x per shift
  - Risk of confirmation bias and reduced sensitivity
- Results identified need for process redesign
  - Unclear and cumbersome process for the bedside nurse
  - Inadequate double check at key points
  - Human error/confirmation bias
  - Contamination risk due to space constraints
- Consequences of not taking action
  - Patient harm
  - Regulatory citations
  - Financial impact
  - Family satisfaction



# Primary Considerations



# Location, Location, Location

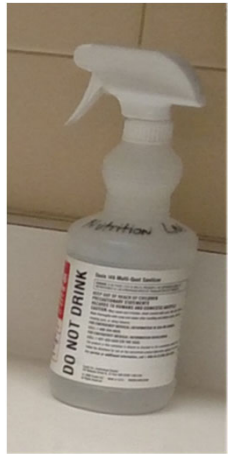


# Storage

- Restricted access
- Human Milk Storage
  - Covered or tall sided bins
  - Temperature monitoring
  - Back up power
  - Adequate space
- Fortifier/Formula Storage
  - Adequate space
  - No cardboard



# Sanitation/Infection Prevention



**Foot controlled trash can**

**Gowns**

**Gloves**



**Food safe sanitizer**

**Hair covering**



**Dishwasher**

**Hands free sink**



**Refrigerator temps**



# Sanitation—Handwashing and Sanitizing Process

1. Wash Hands before starting any part of the process



2. Sanitize workspace with food grade sanitizing wipes



3. Wash Hands



4. Put on gloves



5. Prepare feeding



6. Remove dirty gloves



7. Sanitize workspace with sanitizing wipes



8. Wash Hands



9. Repeat steps 4-8 for each individual feeding

# Sanitation—Thawing Process

- Original Process:
  - Water bath
- Goals:
  - Reduce use of tap water
  - Efficiency
  - Safety
- Outcomes:
  - Time neutral
  - Temperature <room temp
  - Bead microorganism free for 5 weeks without sanitizing



## PRACTICE APPLICATIONS Topics of Professional Interest

### Thawing Human Milk for Hospitalized Infants: Use of a Laboratory Bead Bath May Be an Effective Method for Large Quantities

**H**UMAN MILK FOR HOSPITALIZED infants in the neonatal intensive care unit (NICU) is often stored frozen and must be thawed before use. Frozen milk must be properly thawed, ensuring that no ice crystals remain, while minimizing overheating, to reduce risk of microbial growth and prevent nutrient loss.<sup>1,2</sup> Although frozen milk may be thawed in the refrigerator over 8 to 12 hours, such a process may not be as effective for thawing large volumes for multiple patients or may result in human milk waste if orders change frequently. Therefore, some facilities may require a more rapid thawing method.<sup>3</sup> Such methods include holding the bottle under lukewarm running water or placing it in a container of warm water with the water level below the lid to prevent contamination.<sup>4</sup> However, research has shown that hospital tap water is one potential source of pathogenic organisms in the patient care environment and can cause nosocomial infections.<sup>5,6</sup> Commercial bottle warmers that use tap water also have been reportedly linked with *Pseudomonas aeruginosa* infections in one NICU.<sup>7</sup> Such data have consequently led some experts to recommend that hospitalized patients at high risk for infection avoid all exposure to hospital tap water.<sup>8</sup>

Human milk bottle warmers that do not use tap water are commercially available in the United States. Such warmers are able to thaw 120- to 270-mL volumes in approximately 12 to 25 minutes and allow for a regulated temperature.<sup>9,10</sup> However, each warmer only accommodates up to 270 mL at a time. For hospitals that use centralized human milk preparation and prepare feedings for large numbers of patients, thawing such small volumes at a time would not be feasible, nor would having an individual warmer for each patient's milk to be thawed.

The Children's Hospital of Orange County (CHOC) has high rates of human milk use, with more than 80% of very-low-birth-weight infants discharging home still on human milk. To ensure proper handling and tracking, CHOC employs centralized human milk handling in its Nutrition Lab. Mothers are provided with 2-oz human milk storage containers for milk collection. The Nutrition Lab receives all human milk brought to the facility and tracks it using a bar code scanning system. Human milk feedings are prepared per physician order (including the addition of fortifiers or other additives) and unit dosed into individual feeding syringes or bottles twice daily with 12-hour volumes prepared at each preparation time. Typically, the Nutrition Lab prepares human milk for individual patients.

Human milk bottle warmers that used water to waterless warmers at the bedside in February 2016. However, the practice of thawing milk using warm water baths in the Nutrition Lab was continued, because using individual bottle warmers to thaw that volume of milk was not feasible. Subsequently, a goal was set to identify a waterless thawing option.

Medical laboratories often use both water baths and bead baths to warm samples before analysis. Bead baths consist of a metal basin that is plugged in and filled with small metal beads that heat to the specified temperature. They were designed for laboratory use to allow for better control of contamination. A bead bath was proposed as an effective method of thawing human milk without water. At the time of study initiation, CHOC was aware of one facility potentially using the bead bath for this purpose, but was unable to reach them for further information until after study data were collected. A literature search on the use of bead baths for thawing human milk did not result in any information; therefore, a study was initiated on the effectiveness of using a bead bath for human milk thawing in a centralized preparation setting. We hypothesized that human milk thawed in the bead bath would thaw faster and have reduced potential

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<https://doi.org/10.1016/j.jand.2017.09.014>

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# Accuracy for Orders and Recipes

- Appropriateness of orders
  - Tech training
  - Provider alert
- Calculation of additives
  - Manual processes
  - Automated processes

## DISCERN ALERT

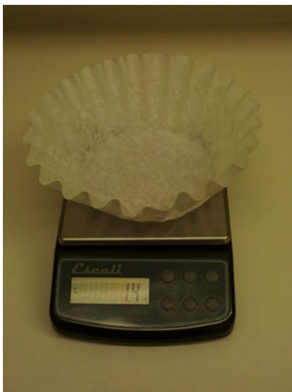
The formula you have selected is not intended for children under 12 months of age. Please confirm this is the desired formula for this patient before proceeding



# Accuracy

## Measurements

- Gram scales for powders
  - Regular calibration
  - Validation of weights
- Syringes or graduated cylinders for liquids



## Proper Labeling

- Patient Name and MRN or ID
- Contents and Caloric Density
- Volume and frequency or rate
- Route of administration
- Expiration date/time
- “Keep refrigerated until used”
- “For enteral use only” or “Not for IV use”



# ID Verification for Human Milk

Patient identification should be confirmed:

- When combining bottles (such as for fortification)
- When relabeling
- Prior to feeding
- At discharge

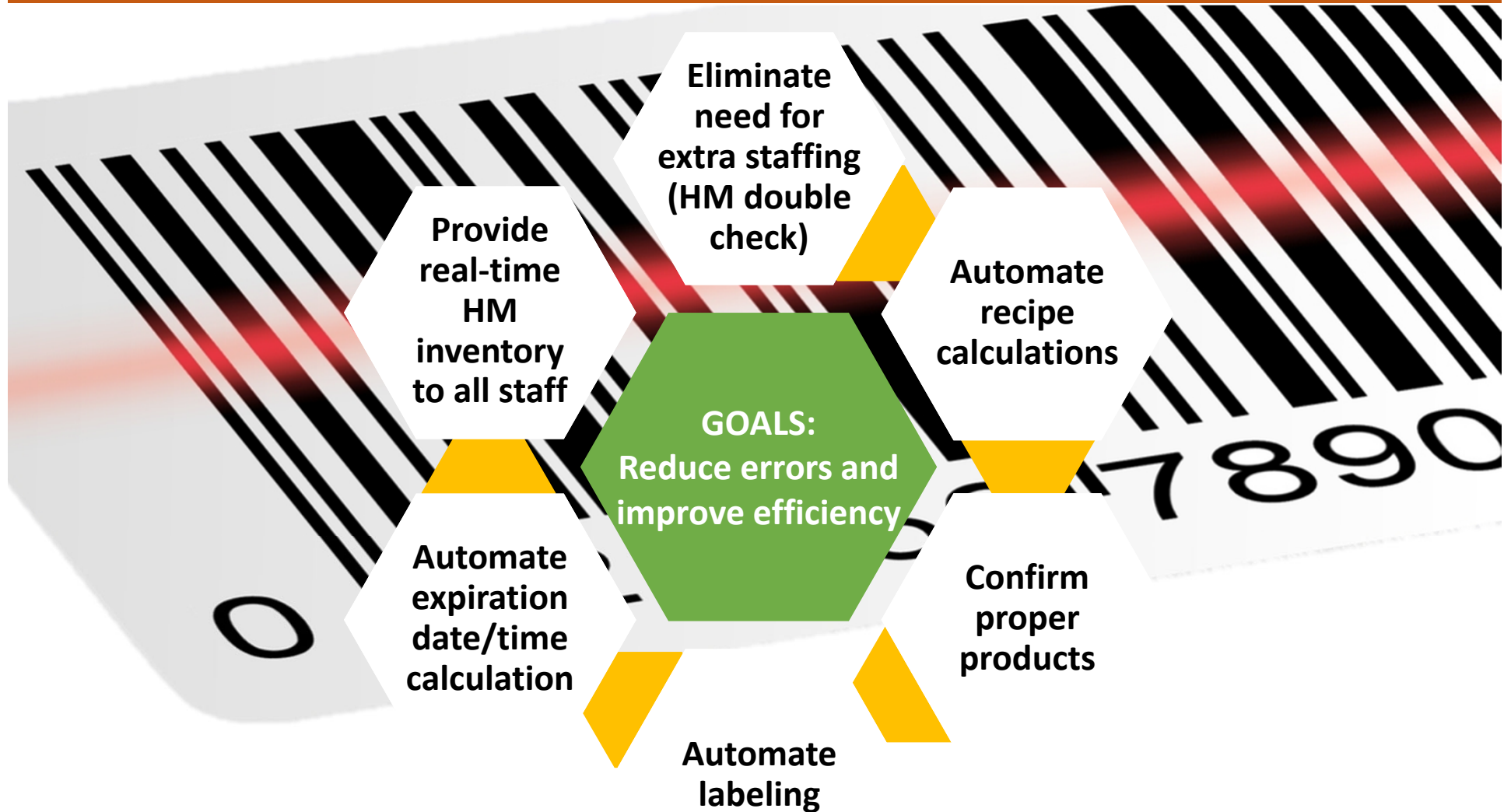


2 person double check of  
2 recognized patient  
identifiers (TJC standards)

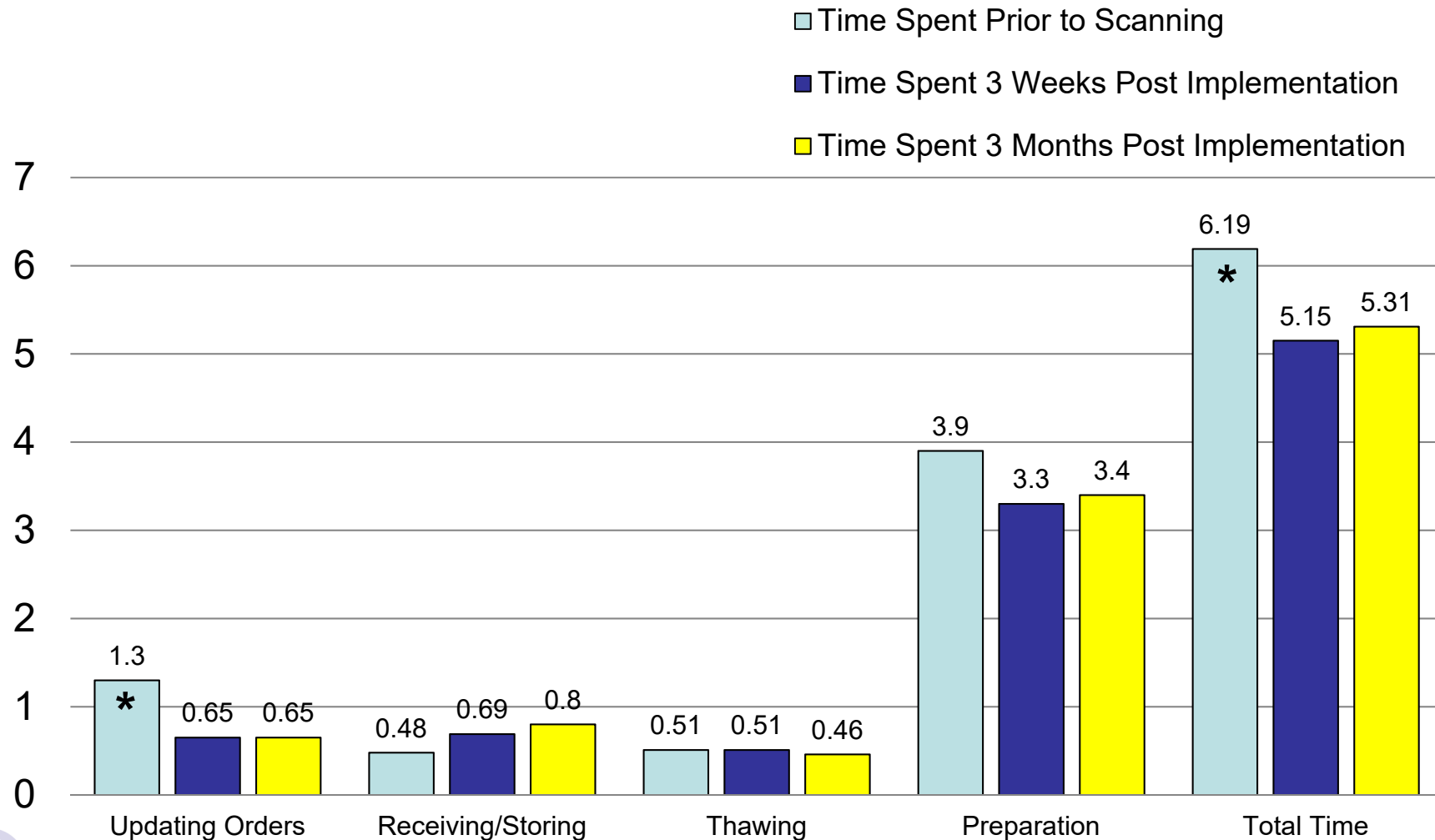
Bar code scanning



# Bar Code Scanning



# Efficiency—Nutrition Lab Time Savings



# Outcomes at CHOC





# Human Milk Errors and Near Misses

	Wrong Milk		Expired Breast Milk	
	Wrong milk actually fed	Wrong milk scanned (near misses)	Expired milk actually fed	Expired milk scanned (near misses)
Prior to Changes May 2010-Dec 2012	3	----	0	----

# Human Milk Errors and Near Misses

	Wrong Milk		Expired Breast Milk	
	Wrong milk actually fed	Wrong milk scanned (near misses)	Expired milk actually fed	Expired milk scanned (near misses)
Prior to Changes May 2010-Dec 2012	3	----	0	----
FY 2013 (Phase I)	0	----	0	----

# Human Milk Errors and Near Misses

	Wrong Milk		Expired Breast Milk	
	Wrong milk actually fed	Wrong milk scanned (near misses)	Expired milk actually fed	Expired milk scanned (near misses)
Prior to Changes May 2010-Dec 2012	3	----	0	----
FY 2013 (Phase I)	0	----	0	----
FY 2014 (Phase II)	0	110	0	193

# Human Milk Errors and Near Misses

	Wrong Milk		Expired Breast Milk	
	Wrong milk actually fed	Wrong milk scanned (near misses)	Expired milk actually fed	Expired milk scanned (near misses)
Prior to Changes May 2010-Dec 2012	3	----	0	----
FY 2013 (Phase I)	0	----	0	----
FY 2014 (Phase II)	0	110	0	193
FY 2015	2	163	0	243
FY 2016	1	182	0	276
FY 2017	1	129	0	340
FY 2018* Total Milk received/processed increased 3-fold from FY 17	1	220	0	537

# Fortifier/Formula Errors and Near Misses

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	Wrong fortifier/ formula actually fed	Wrong fortifier/ formula prepared (not fed)	Near Misses (wrong product scanned)
FY 18 Q3-Q4	0	1	223

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# Published Results

BREASTFEEDING MEDICINE  
Volume 9, Number 9, 2014  
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## Current Concept

### Centralized Breastmilk Handling and Bar Code Scanning Improve Safety and Reduce Breastmilk Administration Errors

Caroline Steele<sup>1</sup> and Christine Bixby<sup>2</sup>

#### Abstract

Safe handling and preparation of breastmilk within the hospital setting are often taken for granted, and the process may not be scrutinized until problems arise. Areas of concern focus on both risk of contamination of breastmilk feedings due to handling and fortification and risk of a breastmilk misadministration. In two phases, Children's Hospital of Orange County (Orange, CA) implemented centralized breastmilk handling and breastmilk bar code scanning. As a result of these process changes, reports of breastmilk administration errors decreased to zero. However, bar code scanning allowed for the tracking of near misses. During the first 6 months of breastmilk bar code scanning, 55 attempts to feed the wrong breastmilk to the wrong patient and 127 attempts to feed expired breastmilk were prevented. Our findings are consistent with current practice recommendations that support the use of centralized breastmilk handling and systems for proper identification of breastmilk.

#### Introduction

SAFE HANDLING AND PREPARATION of breastmilk within the hospital setting are often taken for granted, and, as with many performance improvement initiatives, the process is not scrutinized until problems arise.<sup>1</sup> However, the concept of using quality improvement measures with regard to safe breastmilk handling is not new, and increased emphasis on safe handling of infant feedings has resulted in more facilities utilizing centralized preparation areas where stricter infection control measures may be implemented. More recently, the discussion of safe breastmilk handling and administration has expanded to encompass breastmilk administration errors that are both medical and economic concerns. Bodily fluid exposures are reportable events resulting in costs for infectious evaluation and possible fines, as certain errors may be viewed as Healthcare Insurance Portability and Accountability Act breaches. Therefore, with increasing emphasis on preventing all types of avoidable errors, the handling of breastmilk within the hospital setting is one area that many facilities have been evaluating.

#### Materials and Methods

Between May 2010 and May 2012, Children's Hospital of Orange County (Orange, CA) reported 45 breastmilk handling errors (Table 1). As a result of these errors, some

immediate steps were taken to reduce risk, and a failure mode effects and analysis (FMEA) on breastmilk handling was initiated.

A multidisciplinary FMEA team was formed that included representatives from each hospital inpatient unit, clinical nutrition and lactation services, risk management, transport, and neonatology. This FMEA team reviewed the entire breastmilk handling process, including collection, storage, transport, administration, and discharge, to identify all potential failure points. In total, 282 potential failure points were identified, which were then scored on a scale of 1 to 10 in three categories: severity, occurrence, and detectability. These three scores were multiplied together to obtain a risk priority number for each failure point. The risk priority number scores were then prioritized, and the root causes were identified for each of the top 85 potential failure points. Four primary areas of concern were identified. First, the process was unclear and cumbersome for the bedside registered nurse (RN). Second, there were inadequate double checks at key points in the process, including at the time a mother was provided with labels for her pumped milk and during the preparation process where an RN could be combining multiple bottles to prepare a feeding. Third, due to the frequency of breastmilk handling, there was risk of human error and confirmation bias. With approximately 7,000 individual breastmilk feedings per month, a nurse could handle breastmilk 12



## PRACTICE APPLICATIONS

### Emerging Science and Translational Applications

### Breast Milk Bar Code Scanning Results in Time Savings and Staff Efficiency

PROVIDING BREAST MILK TO A hospitalized infant is generally a more complex process than breastfeeding a healthy baby. Mothers often must pump their milk so that it may be fed via tube or bottle, and the use of human milk fortifiers and other additives to increase calories or other nutrients may be necessary to meet the needs of a preterm or ill infant.<sup>1,2</sup> Because pumping volumes are highly individualized and may vary, preparing an individual baby's feeding may require the combination of multiple bottles of his or her mother's milk or the division of one bottle into multiple feedings. Safety concerns increase with greater manipulation.<sup>2</sup> Improper handling could result in contamination of feedings, which may be life-threatening for the preterm or hospitalized infant.<sup>2</sup> Inaccurate patient identification before combining or splitting containers may lead to a baby receiving the wrong mother's milk.<sup>2</sup> Mathematical calculation errors may result in improper, and possibly harmful, breast milk fortification.<sup>2</sup>

#### DECENTRALIZED VS CENTRALIZED BREAST MILK HANDLING

Typically, the mother of a hospitalized infant will pump breast milk, label the containers using patient labels provided by the facility (usually with the date and time the milk was pumped written in), and bring the milk to the

hospital. Hospitals without centralized breast milk preparation often keep the milk in refrigerators or freezers on the patient units. At the scheduled feeding time, the nurse must retrieve the breast milk from the refrigerator or thaw the proper amount of frozen milk, confirm the breast milk has not expired, measure the proper volume for the feeding, and add in any ordered fortifiers. Each time the nurse prepares a feeding, care must be taken to avoid using expired breast milk, combining bottles of breast milk that are not from the same patient, adding the wrong type or amount of fortifier, or using poor food handling techniques, which could promote microbial growth.<sup>2</sup> Alternatively, hospitals with centralized handling typically store the labeled breast milk the mothers deliver in a centralized preparation room. Trained staff are then responsible for thawing the proper volume of breast milk, adding proper amounts of the correct fortifiers, and accurately labeling the final product to identify both the patient and the contents of the container. Centralized preparation may involve bulk preparation of a "batch" of breast milk for each individual patient; usually a 12-hour or 24-hour volume is prepared in one batch. Alternatively, a 12-hour or 24-hour batch of breast milk for an individual patient may be "unit dosed," meaning it is then portioned into individual containers for each feeding.

#### BREAST MILK MISADMINISTRATION

Breast milk misadministration, or the feeding of the wrong breast milk to the wrong patient, is of great concern in the hospital setting.<sup>1,2</sup> A two-person double check of patient name and medical record number has been used widely in health care for tasks including administration of blood, medication, and breast milk.<sup>3-6</sup> To prevent breast milk misadministration, a double check

is needed at the time labels are provided to a pumping mother as well as during breast milk preparation/fortification, administration, and dispensing remaining milk at discharge, which could require additional staff, while still not eliminating risk of human error.<sup>1,2</sup> Therefore, double checks are becoming increasingly automated.<sup>7-10</sup>

#### METHODS

Breast milk handling in the Children's Hospital of Orange County centralized preparation room (known as the Nutrition Lab) was initiated in January 2013. Two dietetic technicians, registered (DTRs) were present for feeding preparation to ensure manual double checks at each step of the process. For each patient with a breast milk feeding order, the volume needed for a 12-hour period was prepared twice daily by thawing the required amount, adding any ordered fortifiers, and portioning into unit doses so that each individual feeding was in its own container. Tube feedings were portioned into syringes and oral feedings were portioned into bottles. Preparation times were 8:00 AM to 10:00 AM and 3:30 PM to 5:30 PM daily. However, because of potential needs outside designated preparation times, two DTRs were staffed during all hours of operation (6:00 AM-6:30 PM) so that two individuals would always be available to perform a double check.

A bedside double check by a registered nurse (RN) and another staff member or the parent was in place to prevent misadministration at the time of feeding. However, even with such safeguards, there was still risk of human error and the possibility that such an error would go undetected.

Consequently, to reduce the risk of error as well as staffing needs, breast milk bar-code scanning was implemented in November 2013. The bar-code scanning program (Timeless Medical

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# Other Outcomes

- Improved RN satisfaction
- Improved family satisfaction
- Better use of nursing time for other duties



- Recognition from surveyors
- Recognition from the Children's Hospital Association
- Recognition from HIMSS



# Summary

- ✓ Regulatory standards reference the proper handling of food and nutrition products for all patients
- ✓ Centralized handling and bar code scanning are considered best practices by numerous professional and quality organizations
- ✓ Research has shown improved outcomes and time savings associated with centralized handling and bar code scanning
- ✓ Family and staff satisfaction have been tied to implementing such processes

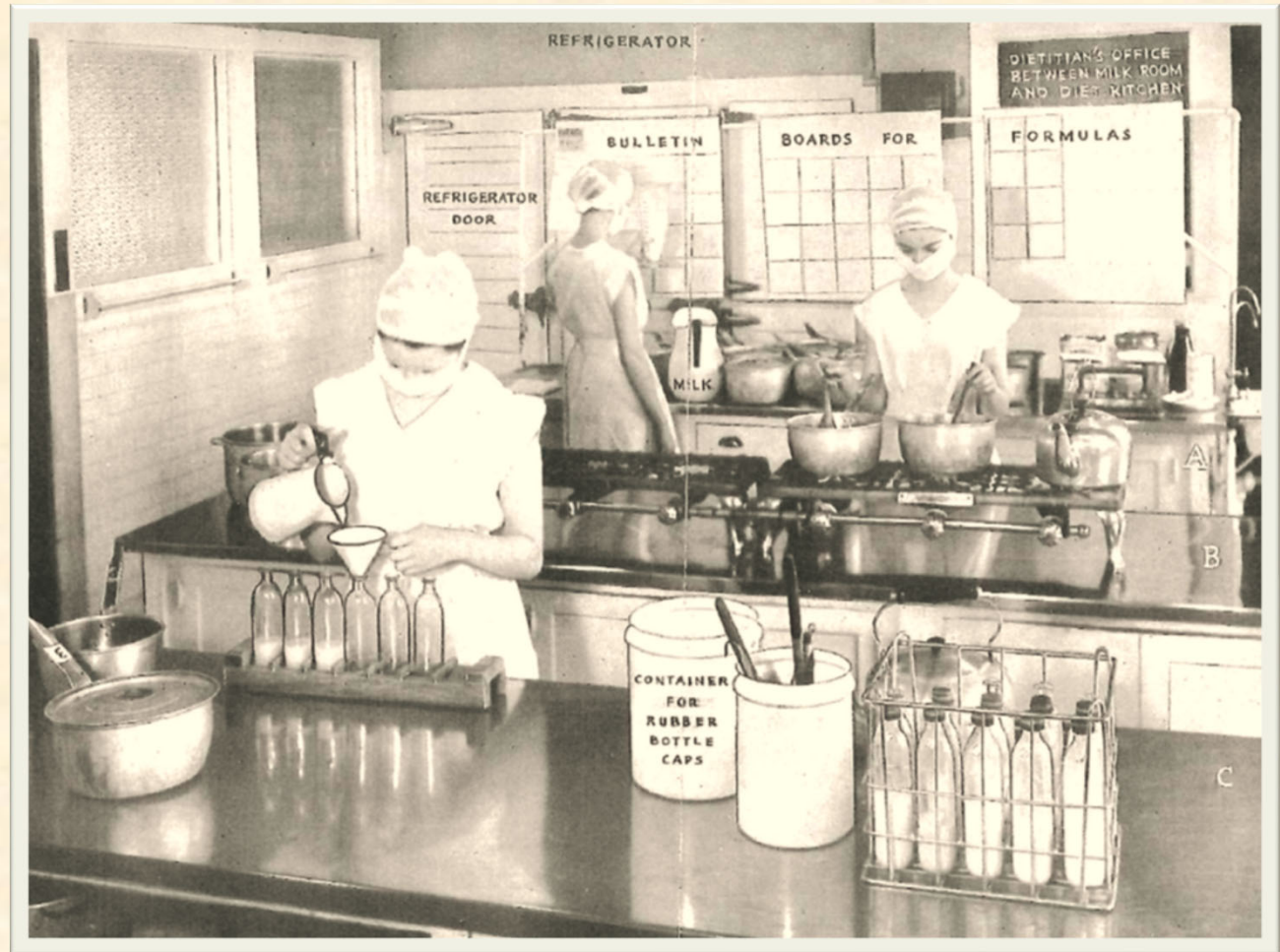




# Essentials of Pediatrics for Nurses (Lippincott 1936)

## Recommendations for the Hospital Milk Room

- A location where infant feedings “can be prepared in a satisfactory manner”
- Separate room with no other purpose or function
- “Clean” technique at all times and methods of preventing contamination
- Preparation accuracy
  - Scales for weighing powders
  - Precise recipes
- Detailed advice on equipment and staffing needs



# ANY Questions?

Please type your question into the *Ask a Question* box  
and hit send.



# Understanding the Current Guidelines for Preparing Pediatric and Newborn Feedings in Health Facilities



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